

## NOTES ON THE CHINESE SARASAESCHNA, WITH DESCRIPTION OF A NEW SPECIES FROM FUJIAN (ODONATA, AESHNIDAE)

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**Abstract** This paper treats six species of the genus *Sarasaeschna* Karube & Yeh in China. *Sarasaeschna zhuae* sp. nov. is described and illustrated from a single male. A key to the Chinese species of the genus is provided.

**Key words** Odonata, Aeshnidae, *Sarasaeschna*, new species, China.

The genus *Sarasaeschna* was established by Karube & Yeh (2001) from Lieftinck's *pryeri* section of *Oligoaeschna* (Lieftinck, 1968), and its type species is *S. pryeri* (Martin, 1909). There are thirteen species of *Sarasaeschna* known so far (Karube & Yeh, 2001; Wilson & Reels, 2001), distributing along a belt extended from East Himalayas to Japan. The main characters of this genus are: median or small size aeshnids, with a heliochromatic colour pattern; frons of head with prominent black F mark superiorly; diameter of head across eyes less than twice the width of frons; hind femur usually as long as synthorax; venation simple, supertriangles usually free; auricles roundly angled; ♂ superior appendages usually slender and knife-shaped in lateral view, inferior appendage deeply bifid; ♀ cerci short and inconspicuous; sperm vesicle broadly hollow ventrally and cup-shaped, distal segment of penile organ with a triangular expansion, flagella sickle-shaped, as long as glans, sometimes twisted.

To date, five *Sarasaeschna* species have been reported in China (Karube & Yeh, 2001; Wilson & Reels, 2001; Wilson, Reels & Xu, 2008). The present paper treats six species of *Sarasaeschna* recorded from China. *Sarasaeschna zhuae* sp. nov. is described and illustrated here from a single male. The holotype specimen is deposited at Zhangzhou City University, Fujian, China. The new taxon represents the first record of the genus *Sarasaeschna* from continental China.

### Checklist of *Sarasaeschna* in China

#### *S. lienii* (Yeh & Chen, 2000)

*Oligoaeschna lienii* Yeh & Chen, 2000. *Odonatologia*, 29 (2): 138–142, figs. 1–6, 14, 19c.

*Sarasaeschna lienii* Karube & Yeh, 2001. *Tombo*, 43: 5, figs. 14, 32.

Distribution. China (Taiwan).

#### *S. niusatoi* (Karube, 1998)

*Oligoaeschna niusatoi* Karube, 1998. *Gekkaru Mushi*, (330): 2–5, figs. 1, 5–10.

*Sarasaeschna niusatoi* Wilson & Reels, 2008. *Echo*, 5: 9.

Distribution. China (Hainan); Vietnam.

#### *S. pyanan* (Asahina, 1951)

*Oligoaeschna pyanan* Asahina, 1951. *Kanryû*, 19 (1): 19, fig. 35; Lieftinck, 1968. *Tijdschr. Ent.*, 111 (5): 147, 161, fig. 3; Yeh & Chen, 2000. *Odonatologia*, 29 (2): 145, figs. 19b, 20c.

*Sarasaeschna pyanan* Karube & Yeh, 2001. *Tombo*, 43: 5, figs. 11, 29.

Distribution. China (Taiwan).

#### *S. sabre* (Wilson & Reels, 2001)

*Oligoaeschna sabre* Wilson & Reels, 2001. *Odonatologia*, 30 (2): 180–181, figs. 92–97.

Distribution. China (Hainan).

#### *S. tsaoapiensis* (Yeh & Chen, 2000)

*Oligoaeschna tsaoapiensis* Yeh & Chen, 2000. *Odonatologia*, 29 (2): 142–145, figs. 7–12, 13, 19f.

*Sarasaeschna tsaoapiensis* Karube & Yeh, 2001. *Tombo*, 43: 4, figs. 8, 26.

Distribution. China (Taiwan).

#### *S. zhuae* sp. nov.

Distribution. China (Fujian).

### Key to male species of *Sarasaeschna* in China

- Two rows of cells present between MA and M<sub>1</sub>pl in all wings; ♂ inferior appendage about 2/3 or 5/6 length of superior appendages ..... 2  
One row of cells present between MA and M<sub>1</sub>pl in all wings; ♂ inferior appendage less than 2/3 length of superior appendages ..... 4
- Large sized; ♂ inferior appendage about 5/6 length of superior appendages ..... *S. zhuae* sp. nov.  
Medium sized; ♂ inferior appendage about 2/3 length of superior appendages ..... 3
- Postclypeus marked with chrome yellow band; segment 1 of abdomen marked with chrome yellow on dorsum and on both sides; the tip of ♂ superior appendage pointed, the inner side of ♂ superior appendage with a pronounced semicircular depression ..... *S. pyanan*  
Postclypeus reddish brown, margined with light green band; segment 1 of abdomen entirely black; the tip of ♂ superior appendage rounded, ♂ superior appendage with a very small ventral spine at about basal 1/5, and heel-shaped at about apical 3/5 of inner side ..... *S. niusatoi*
- Upper ends of dorsal stripes of synthorax extending to antealar ridge; abdomen tapering markedly from segment 4 towards its tip, widest at segments 3–4 beyond initial bulge, narrowing to half its width at segment 8; ♂ superior appendages with sabre shaped distal curvature ..... *S. sabre*  
Upper ends of dorsal stripes of synthorax very close to or a little connected with spots above them; abdomen spindle shaped from distal half of segment 3 to segment 7, widest at segments 4–5; ♂ superior appendages not as above ..... 5

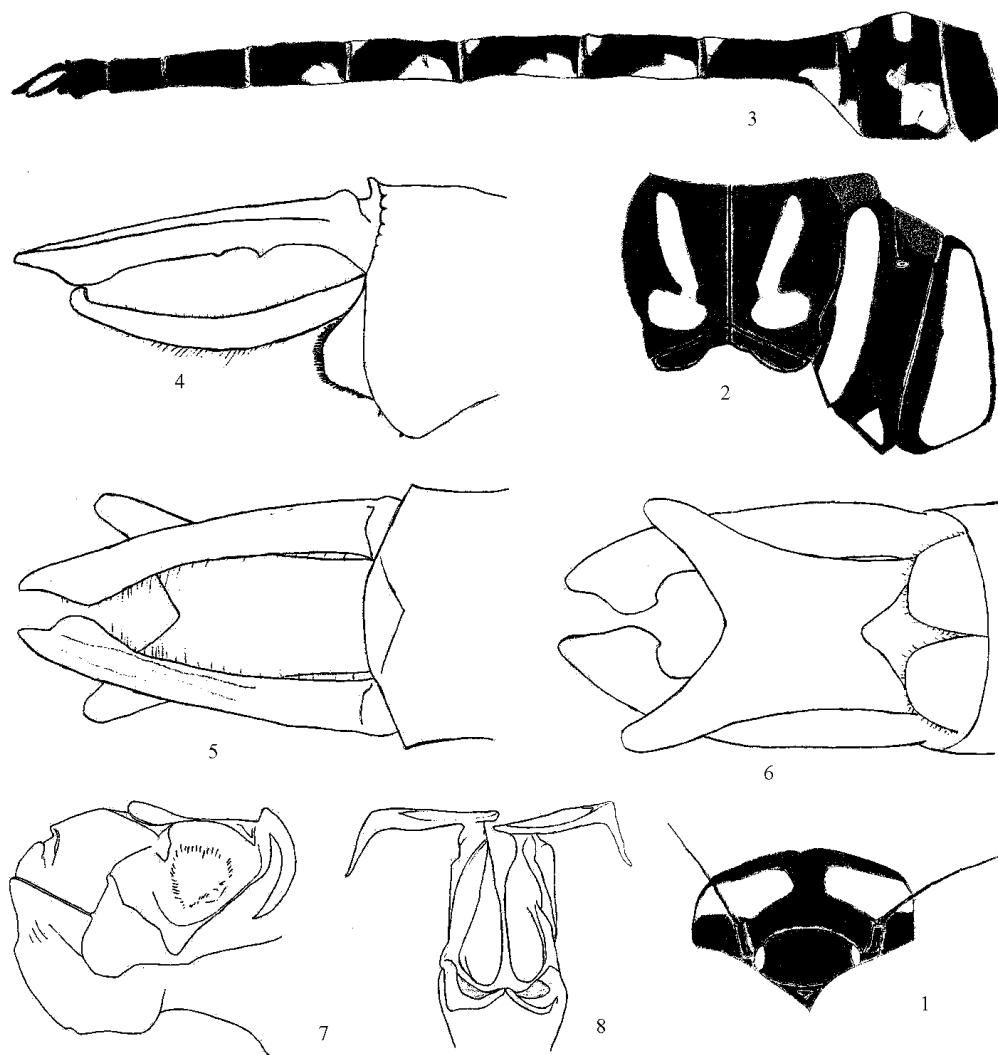
5. Lower margin of postclypeus bordering anteclypeus broadly black; segment 1 with two spots on dorsum; segment 2 with six spots on dorsum and three spots on each side; ♂ superior appendages razor knife-shaped ..... *S. tsaopiensis*  
Lower margin of postclypeus bordering anteclypeus lacking broad dark band; segment 1 unmarked dorsally; segment 2 with five spots on dorsum and two spots on each side; ♂ superior appendages with shallow and broad ventral emargination and weakly apical expansion .....  
..... *S. lienii*

*Sarasaeschna zhuae* sp. nov. (Figs. 1-9)

Male. Labium orange brown. Mandible brown, its apical portion blackish brown. Labrum blackish brown. Anteclypeus blackish brown. Postclypeus brown, its upper margin narrowly orange yellow. Frons black, broad and not protuberant anteriorly, its dorsal side with paired transverse green spots. Vertex black, about  $\frac{2}{5}$  width of frons, markedly tumid, with densely long blackish hairs. Eyes small, diameter of head across eyes less than twice the width of frons; interorbital suture a little longer than occipital triangle. Antennae black.

Occiput black, covered with densely long blackish hairs. The dorsal view of frons and vertex as shown in Fig. 1.

Prothorax black. Synthorax black, with green or yellowish green markings. Dorsal carina ridged triangularly on upper end. Dorsal stripes green, directed outward and downward toward outer ends of collar carina, connected above with paired elliptical spots situated near antealar ridge. Mesepimeron with broad yellowish green stripe. Metepisternum with small green triangular spot on upper end. Metepimeron with largely yellowish green stripe. Mesokatepisternum and metakatepisternum brown. The colour pattern of synthorax as shown in Fig. 2. Legs black with brown coxae. Hind femur as long as synthorax. Wings hyaline, tinted with amber at extreme base in all wings, enfumed with pale yellow in forewings and golden yellow in the hind. Pterostigma brown, braced at its proximal side, 3.8-4.0 mm in length, covering 2.5-3.0 cells. Two rows of cells present between MA and M<sub>1</sub>pl. Nodal index 8



Figs 1-8. *Sarasaeschna zhuae* sp. nov. ♂. 1. Frons and vertex, dorsal. 2. Synthoracic colour pattern, dorso-lateral. 3. Abdominal colour pattern, lateral. 4. Caudal appendages, lateral. 5. Caudal appendages, dorsal. 6. Caudal appendages, ventral. 7. Penile organ, lateral. 8. Distal segment of penile organ, ventral.

17: 18-8 in forewings, 9-11: 12-9 in the hind. Median space free. Triangle three celled. Hypertriangle and subtriangle free. Anal loop five celled. Anal triangle three

celled. Tornus roundly angulate. Membranule darkish grey, well developed.



Fig 9. *Sarasaeschna zhuiae* sp. nov. ♂

Abdomen black with green or greenish yellow markings, inflated at basal 2 segments. Dorsally, constricted sharply from posterior end of segment 2 to anterior half of segment 3, spindle-shaped from distal half of segment 3 to segment 7, then a little expanded again from segment 9 to segment 10. Segment 1 unmarked. Dorsally, segment 2 with a greenish yellow triangular spot at dorso-anterior border, and with paired medio-dorsal greenish yellow rectangular spots and paired greenish yellow semicircular spots at dorso-posterior border; segments 3-6 with paired green subtriangular spots at dorso-posterior border respectively. Laterally, segment 2 with a large yellowish green spot covering auricle, and connecting with a small obscure brown spot at the middle; auricle not well developed, projecting backward and roundly angled, armed with small dark spines along posterior edge; intersegmental membrane between segment 2 and segment 3 with a ventro-lateral greenish yellow spot; segments 3-7 with a conspicuous greenish yellow spot at ventro-lateral base respectively. Ventrally, segments 4-8 with paired yellowish green basal spots respectively. Segment 9 and segment 10 entirely black. The lateral colour pattern of abdomen as shown in Fig. 3. Caudal appendages black. Superior appendages

slender, curved inwards at distal end and slightly downwards, somewhat pointed at apex, with a ventral lobe at subapex, and two small ventral teeth at basal 2/5 and the middle respectively. Inferior appendages 5/6 of the length of superiors, divaricate at apical 1/3 with two forks markedly diverging outwards, gently curved upwards and small hook-shaped at apex. The caudal appendages as shown in Figs. 4-6. Penile organ complicated in shape, resembling those of *S. pyman* (Asahina, 1951) and *S. speciosa* (Karube, 1998a) as illustrated and described by Yeh & Chen (2000) and Karube & Yeh (2001). Sperm vesicle broadly hollow ventrally and cup-shaped, with strongly protruding marginal flange. Laterally, median segment of penile organ notched at outer side; distal segment with vestigial microsculptures at apicolateral sides, its dorsal flange protruding dorsally and forming a triangular expansion; flagella flat and sickle shaped, extended perpendicularly to glans. Ventrally, distal segment with paired crest shaped "bony plates" protruding and heavily sclerotized; flagella well developed, bent strongly and ram-horn shaped. The penile organ as shown in Figs. 7-8.

Measurements mm. Abd. + app. 58; hw. 46.

Holotype ♂, China, Fujian Province, Huan

County (24°49' N, 117°45' E), 5 July 2007, leg. XU Qi Han, deposited at Zhangzhou City University in Fujian Province, China. Female unknown.

**Etymology.** The new species is named in honor of Prof. ZHU Hui Qian, an odonatologist of Shanxi University.

**Differential diagnosis.** Species of *Sarasaeschna* are highly homogeneous in general appearance, and highly varied in the shape of their caudal appendages. So, it is not easy to correlate new species with other *Sarasaeschna* species based on appearance and caudal appendages. But, judging from the character of the penile organ, the new species is undoubtedly closely related to *S. pyanan* and to *S. peihoa*, since it shares features with the latter two species as follows: flagella long, flat and strongly bent, extended perpendicularly to glans; distal segment with paired crest shaped ventrobasal bony plates, and vestigial microsculptures at apicolateral sides (Karube & Yeh, 2001). The new species can be easily separated from all other *Sarasaeschna* species by the following distinct characters: 1) the largest of all *Sarasaeschna* species; 2) face generally brown except for a narrowly orange yellow band on the upper margin of postclypeus; 3) basal S3-S7 with large and conspicuous markings on lateral sides; 4) superior appendages with a ventral lobe at subapex, and two small ventral teeth at basal 2/5 and the middle respectively; inferior appendages 5/6 of the length of superior appendages, the longest of all *Sarasaeschna* species.

## 中国萨蜓属分类研究并记述一新种 (蜻蜓目, 蜓科)

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**摘要** 记述萨蜓属 *Sarasaeschna* Karube & Yeh 的中国种类共计 6 种, 其中包括 1 新种, 即朱氏萨蜓 *S. zhuae* sp. nov.。正模 ♂, 福建省华安县, 2007-07-05, 徐奇涵采。模式标本存放在漳州城市职业学院生物标本室。给出了萨蜓属中国已知种的名录、地理分布和检索表。新种区别于萨蜓属其它种的

**关键词** 蜻蜓目, 蜓科, 萨蜓属, 新种, 中国。

中图分类号 Q969.229.3

**Biological notes.** The new species was found at an elevation of ca. 1 200 m a. s. l. It was hovering low above a shady puddle before captured. The puddle was situated in a small forest clearing full of vegetative litter.

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主要特征如下: 1) 在萨蜓属中个体最大; 2) 脸部总体为棕色, 仅后唇基上缘具狭小黄色横带; 3) 腹部第 3~7 节基部侧面具大而明显的黄绿色斑; 4) 上肛附器腹侧亚端部具 1 半圆形突起, 正中处和近基部 2/5 处各具 1 小齿; 下肛附器长达上肛附器的 5/6, 为萨蜓属中最长者。